Industry Partnerships for Environmental Science and Technology

Future Opportunities in EM Science & Technology: Applied R&D Needs, Technology Gaps

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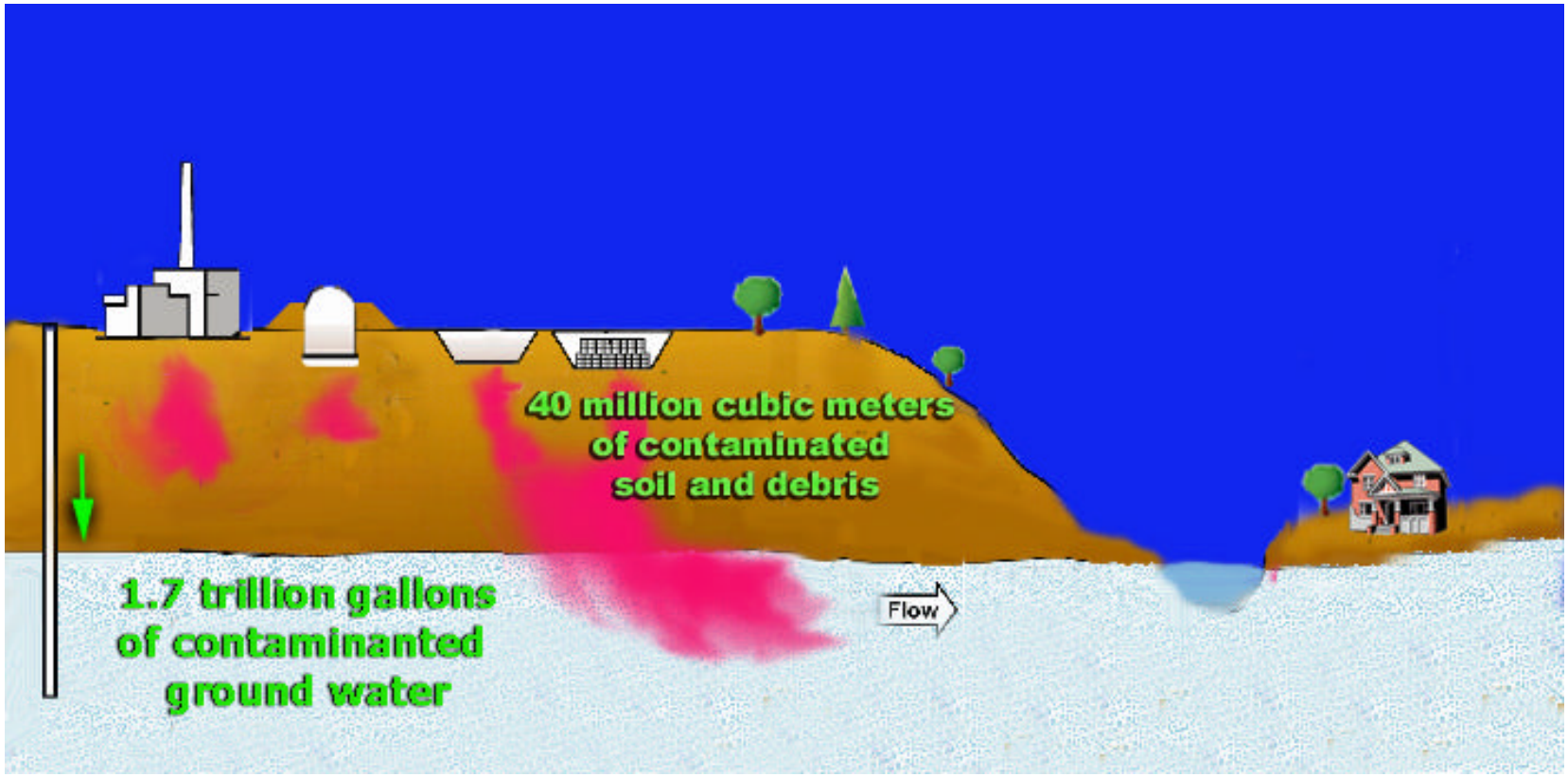
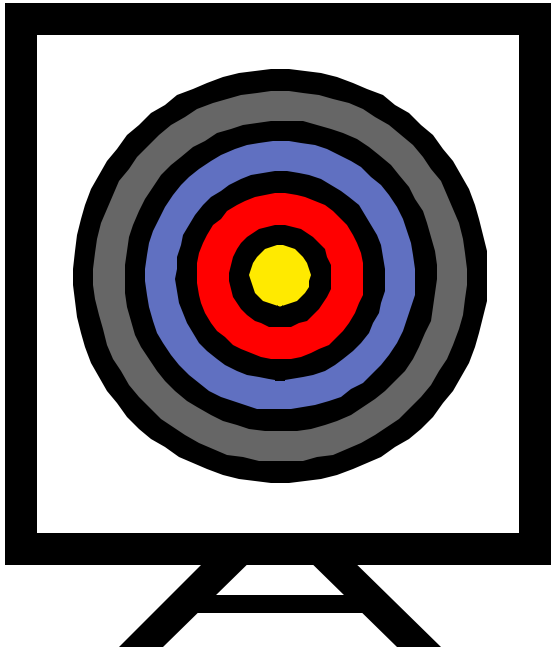
Focus Area Mission

The Subsurface Contaminants Focus Area is the national technology program responsible for providing environmental stewards with technical solutions to their subsurface contamination problems



Technical Targets:
A New Way To Describe SCFA Program

- 339 individual site needs = 14 technical areas (targets)
- I.e., 339 symptoms = 14 diseases
- Technical Targets represent highest priority problem areas
- Identify areas that require strategic investments
- Targets will encourage a broader and more balanced R&D portfolio



- Targets will focus RFPs to industry, universities, and national laboratories

Targets for Industry To Aim At

- Design, Construct, and Verify Long Term Containment and Monitoring Systems
  - –Design Guidance Manual
- Improved Subsurface Access and Delivery Systems and Equipment
  - –Deep and Difficult Situations
- Methods To Verify and Validate Performance
  - –Instruments, Protocols
- Techniques and Technologies that Support Non/Minimally Invasive Characterization of Contaminant Sources

Industry/University
Applied Research Call Selections

These 9 selected projects show what winners look like:

- In-Situ, Long-Term Monitoring System for Radioactive Contaminants
- Development of a Down-Hole Monitoring System for Tritium in the Groundwater and Vadose Zones
- Down-Hole Tritium Analysis System for Deep Monitoring Wells
- Development of In-Situ Chelation/Reduction Process for Remediation of Subsurface Metals and Radionuclides
- Long-Term Monitoring Sensor Network
- In-Situ Chemical Stabilization of Metals and Radionuclides Through Enhanced Anaerobic Reductive Precipitation
- Microsensors for Ultrasensitive Detection of Hexavalent Chromium in Groundwater
- Use of Apatite for Chemical Stabilization of Subsurface Contaminants
- In-Situ Stabilization of Subsurface Contaminants Using Microbial Polymers

Planned Future Calls for Proposals

EMSP – December ‘01; check http://emsp.em.doe.gov/

ESTCP - January ‘02 likely; check http://www.estcp.org

SERDP – July ‘02 likely; check http://www.serdp.org

Potential for NABIR/SCFA joint call; check http://www.envnet.org/scfa/

Subsurface Contaminants Focus Area

High-Priority Technology Needs

- **Covers**
  - -Surface barriers for non-TRU soils and burial grounds that are less expensive than Hanford Barrier
  - - Validation of containment system at OSDF
  - - Capping Design for Arid and Semi-Arid Climates
  - - Long-term management of void space, containers, and cover subsidence of disposed waste
- **Waste Minimization**
  - - Soil volume reduction-Pu
  - - Real-time sorting of soil and debris for organics, metals, HEs, or radioactives.
- **GW Treatment**
  - - Well plugging issue for reinjection system
  - - Alternatives to pump and treat for CCl_4 and Sr-90 in groundwater

Subsurface Contaminants Focus Area

High-Priority Technology Needs

- **Soils and GW Monitoring**
  - Automation of monitoring
  - Real-time field instruments for characterization and monitoring of soils & ground water
  - Downhole, real-time monitoring
  - Lessening the costs of ground water monitoring
  - Reliable in situ monitoring technologies needed to reduce costs
  - Deep well sampling
- **Characterization Burial ground/AOC**
  - In-situ Assay Systems to support excavation
  - Methods to detect boundaries and contents of burial grounds to 20-foot depths
  - In-situ debris characterization for partial retrieval
  - Retrieved waste sorting and characterization and remediation of secondary soil contamination

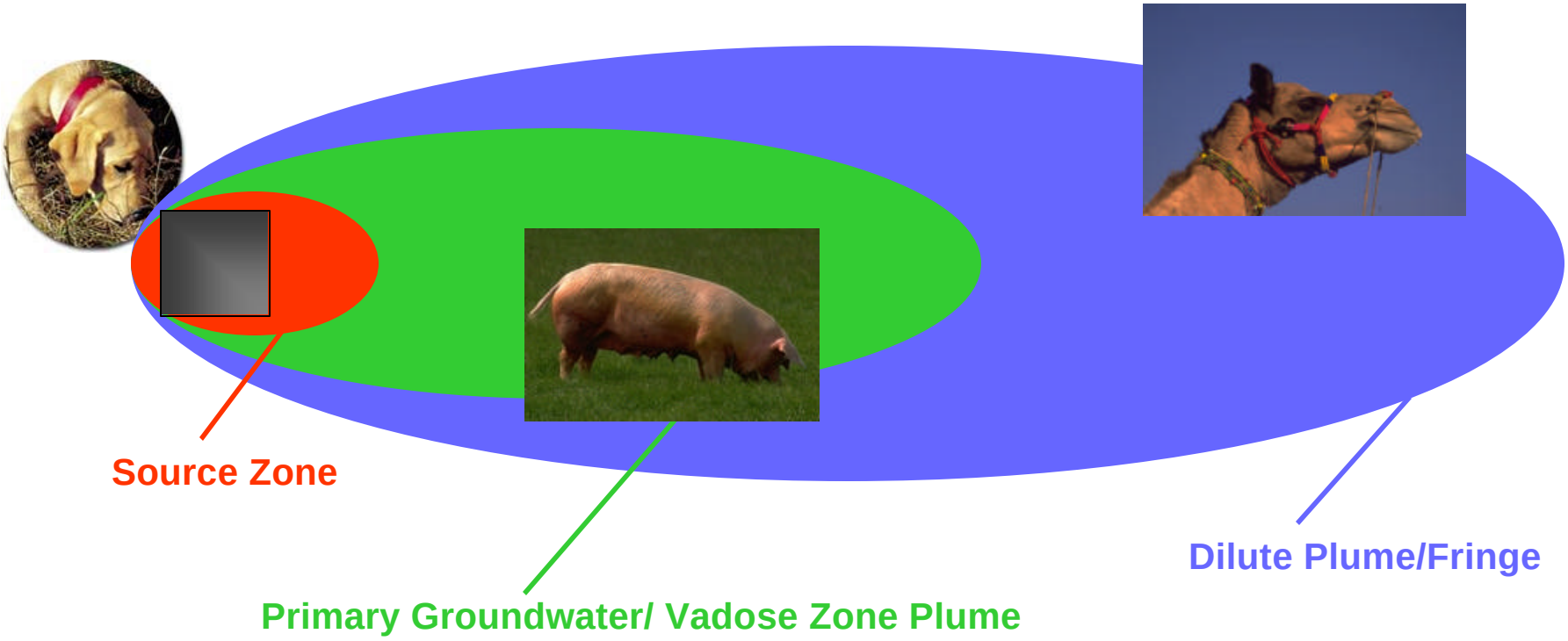
Subsurface Contaminants Focus Area

High-Priority Technology Needs

- **Characterization, Subsurface utilities**
  - Instrumentation to locate subsurface utilities and stainless steel piping.
- **Dispersed source characterization and treatment**
  - DNAPL characterization and treatment
  - Mercury characterization and treatment
  - Characterization and Remedation of HE/metal contaminated soil
  - In-situ TCE detector in clay soils
  - Hydro-geophysics, electrical methods
  - Exploration of cross-well conductivity
- **Stabilization/Source Containment**
  - Develop and test compounds for direct injection for in-situ stabilization of Uranium
  - Pit 7 Area Tritium Source Control
- **Characterization, Beneath buildings**
  - Access technologies for characterization and remediation of subsurface contaminants in difficult geologies (caliche, cobbles)
  - Characterization underneath building

Creative Solutions! Who Nose…?

- The “silver bullet” solution may take many forms
- DNAPL dogs, pigs, maybe camels
- Not shown: GPS transmitters around their necks



We Are Always Looking For Breakthrough Solutions

Come by or contact us at your convenience.

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